

MINERAL INDUSTRY SURVEYS

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NICKEL IN SEPTEMBER 1997

Reported domestic nickel consumption in September, on a daily average basis, was slightly less than that of August, according to the U.S. Geological Survey. Daily usage by the stainless steel industry was down about 2% from the August average of 105 metric tons (t). Consumption of elemental nickel to make nickel-base corrosion resistant alloys increased 15%. However, sales to plating companies averaged only 38 t per day, 12% less than in August. Consumer stocks of cathode, briquets, and powder continued to grow and were at their highest level since November 1996. Total stocks in London Metal Exchange warehouses rose to 60,700 t, a 2-year high. Percentages reported in this paragraph may not be verifiable owing to concealment of company proprietary data. Imports of primary nickel for January-August 1997 totaled 97,200 t, almost the same tonnage as in the first 8 months of 1996. Trade data for September will appear in a subsequent issue.

General Motors delivers first mass-produced U.S. pickup trucks powered by nickel-metal hydride batteries

On November 12, General Motors Corporation delivered its first Chevrolet S-10 pickup truck equipped with an advanced nickel-metal hydride (Ni-MH) battery to Southern California Edison Co. Identical trucks were delivered to Detroit Edison Co. and Georgia Power Co. the next day. The three trucks are the first of 30 to be field tested under a set of partnerships between General Motors' Advanced Technology Vehicles group

and regional utilities that have been most supportive of the emerging electric vehicle (EV) industry (Energy Conversion Devices, Inc., 1997).

The Ni-MH battery packs are being manufactured by GM Ovonic L.L.C., a joint manufacturing venture between Ovonic Battery, Inc. and General Motors. Ovonic Battery is a subsidiary of Energy Conversion Devices, Inc. of Troy, MI. The batteries provide more than twice the driving range of lead-acid batteries of the same weight. The new battery pack weighs 430 kilograms (950 pounds). Data gathered during the field test will be used to improve the GM Ovonic battery before it is put into full production for the S-10 truck in the first half of 1998. The field test is just one of a number of ongoing developments designed to put thousands of EV's on U.S. highways in an effort to curb urban air pollution (Wilkinson, 1997). U.S. and Japanese automobile manufacturers have agreed to comply with clean air requirements mandated by California and other States beginning in the year 2003.

References Cited

- Energy Conversion Devices, Inc., 1997, General Motors introduces nickel metal hydride batteries in Chevrolet S-10 electric pickup trucks: Energy Conversion Devices, Inc. press release, November 13, 2 p.
- Wilkinson, Sophie L., 1997, Electric vehicles gear up: Chemical & Engineering News, v. 75, no. 41, October 13, p. 18-23.

TABLE 1
CONSUMPTION OF NICKEL (EXCLUSIVE OF SCRAP), BY FORM AND USE 1/

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total	Total year to date
1996:					
September	6,050	1,540	178	7,770	75,000
October	6,740	1,750	320	8,810	83,800
November	5,700	1,340	365	7,400	91,200
December	5,690	1,650	181	7,520	98,700
January-December	78,100	17,600	2,980	98,700	XX
1997:					
January	6,900	2,000	101	9,000	9,000
February	5,950	1,510	129	7,590	16,600
March	5,730	1,580	253	7,570	24,200
April	6,480	1,490	570	8,540	32,700
May	6,600	1,300	410	8,310 r/	41,000
June	6,630	1,280	434	8,350	49,300
July	6,600	1,640	299	8,540	57,900
August	6,150 r/	1,460	164	7,760 r/	65,600 r/
September:					
Steel:					
Stainless and heat resisting	1,580	1,350	W	2,930	32,500
Alloy (excludes stainless)	481	W	W	481	5,620
Superalloys	784	--	W	784	7,120
Copper-nickel alloys	W	W	--	W	W
Electrical, magnetic, and expansion alloys	7	--	--	7	W
Other nickel & nickel alloys	W	W	W	W	W
Cast iron	W	--	W	W	W
Electroplating (sales to platers)	1,130	--	W	1,130	11,300
Chemical and chemical uses	W	--	W	W	W
Other uses	1,690	124	287	2,100	16,500
Total reported	5,670 2/	1,470	287	7,430	73,100
Total all companies (calc) 3/	XX	XX	XX	11,200	110,000
1997: January-September	56,700	13,700	2,650	73,100	XX
1996: January-September	60,000	12,900	2,110	75,000	XX

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Other uses" category. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Of consumption, 4,750 metric tons were consumed as cathodes and pellets, the remainder as briquets and powder.

3/ Figures represent calculated apparent consumption; based on the revised proportion of reported primary consumption (66.21%) to apparent primary consumption for 1996.

TABLE 2
ENDING STOCKS OF NICKEL (EXCLUSIVE OF SCRAP) HELD BY CONSUMERS,
BY FORM AND USE 1/ 2/

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total
1996:				
September	2,910	277	82	3,270
October	2,770	472	82	3,320
November	6,170	625	64	6,860
December	4,990	1,540	78	6,610
1997:				
January	4,370	659	55	5,080
February	3,970	231	180	4,390
March	4,020 r/	240	603	4,870 r/
April	3,780	366	633	4,770
May	3,240	344	581	4,170
June	3,880	389	302	4,570
July	4,640	383	136	5,160
August r/	5,180	286	167	5,630
September:				
Steel (stainless, heat resisting and alloy)	4,260	434	93	4,780
Nonferrous alloys 3/	1,660	(4/)	(5/)	1,660
Foundry (cast irons)	2	--	--	2
Chemical (catalysts, ceramics, plating salts, etc.) and unspecified uses	174	--	74	248
Total	6,090	434	167	6,690

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Stocks held by companies that consume nickel in more than one end use category are credited to the major category. Stocks are subject to revisions owing to inventory adjustment.

3/ Includes superalloys, nickel-copper and copper-nickel alloys, permanent magnet alloys, and other nickel alloys.

4/ Included in "Chemicals and unspecified uses" category of "Oxide-sinter, salts, and other forms".

5/ Included in "Chemicals and unspecified uses" category.

TABLE 3
CONSUMPTION AND ENDING STOCKS OF PURCHASED SECONDARY NICKEL, BY USE 1/

(Metric tons, nickel content)

Period	Consumption			Stocks		
	Ferrous scrap 2/	Nonferrous scrap 3/	Total scrap	Ferrous scrap 2/	Nonferrous scrap 3/	Total scrap
1996:						
September	3,490	871	4,370	3,100	110	3,210
October	3,600	773	4,370	3,340	107	3,450
November	3,250	785	4,030	3,630	89	3,720
December	3,320	656	3,970	3,510	88	3,600
January-December	43,400	9,980	53,400	XX	XX	XX
1997:						
January	4,800	844	5,650	3,160	116	3,280
February	3,880	805	4,690	3,290	114	3,400
March	4,250	1,010	5,260	4,090	104	4,190
April	5,260	789	6,050	3,820	113	3,940
May	4,750	840	5,590	3,790	114	3,900
June	4,770	755	5,520	3,900	112	4,020
July	5,190 r/	826 r/	6,020 r/	3,380	115	3,490
August	3,780	760	4,540	3,930	114	4,040
September	3,800	768	4,570	3,680	107	3,790
1997: January-September	40,500	7,400	47,900	XX	XX	XX
1996: January-September	33,200	7,760	41,000	XX	XX	XX

r/ Revised. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Nickel content is calculated from an average nickel content and the reported gross weight of scrap.

3/ Combined consumption and stocks of aluminum-base, copper-base, and nickel-base scrap.

TABLE 4
U.S. IMPORTS FOR CONSUMPTION OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content 2/)

Period and country of origin	Cathodes, pellets, and briquets	Powder and flakes	Ferro- nickel	Metal- lurgical- grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total 3/	Total year to date 4/	Wrought nickel
1996:										
August	9,250	835	1,120	14	235	319	265	12,000	103,000	44
September	9,390	629	884	33	416	322	234	11,900	114,000	52
October	7,850	779	1,050	60	581	373	311	11,000	125,000	67
November	9,820	670	1,520	99	328	308	290	13,000	138,000	38
December	9,180	815	969	21	351	275	251	11,900	150,000	61
January-December	113,000	9,690	16,000	463	4,270	3,790	3,270	150,000	XX	636
1997:										
January	7,640	954	1,180	111	364	263	265	10,800	10,800	57
February	9,310	945	1,180	395	696	392	242	13,200	23,900	53
March	14,500	1,130	1,070	277	544	342	198	18,100	42,000	73
April	7,920	948	1,050	347	572	433	294	11,600	53,600	78
May	13,900	838	1,420	217	370	469	297	17,500	71,100	99
June	5,240	625	1,240	49	482	511	256	8,400	79,500	40
July	8,190	520	1,280	10	643	529	271	11,400	90,900	82
August:										
Australia	1,010	60	--	11	--	--	--	1,080	7,770	--
Canada	3,830	567	--	161	85	152	29	4,830	38,600	(5/)
Colombia	--	--	--	--	--	--	--	--	1,030	--
Dominican Republic	--	--	456	--	--	--	--	456	5,360	--
Finland	390	39	--	--	--	--	34	463	3,790	--
France	118	(5/)	100	--	53	12	19	303	1,990	8
Germany	--	1	--	--	32	--	19	52	536	77
Japan	--	3	--	(5/)	15	6	33	57	635	8
New Caledonia	--	--	400	--	--	--	--	400	2,440	--
Norway	2,410	--	--	--	--	--	--	2,410	17,100	--
Russia	2,960	--	--	--	--	--	--	2,960	17,800	--
South Africa	56	--	--	--	--	--	4	60	261	--
United Kingdom	--	28	--	--	112	--	33	173	2,140	(5/)
Zimbabwe	36	--	--	--	--	--	--	36	928	--
Other	--	54	--	--	37	189	59	339	4,010	18
Total	10,800	752	956	172	334	359	230	13,600	105,000	111
1997: January-August	77,500	6,710	9,360	1,580	4,010	3,300	2,050	105,000	XX	594
1996: January-August	76,600	6,800	11,600	251	2,600	2,510	2,180	103,000	XX	418

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%), sulfates (22%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide and hydroxide (65%).

3/ Excludes wrought nickel.

4/ May include revisions for prior months.

5/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 5
U.S. EXPORTS OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content 2/)

Period and country of destination	Cathodes, pellets, and briquets	Powder and flakes	Ferro- nickel	Metal- lurgical- grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total 3/	Total year to date 4/	Wrought nickel
1996:										
August	44	97	299	348	703	2,200	424	4,120	29,800	64
September	6	80	179	359	1,210	2,230	292	4,360	34,200	27
October	20	79	359	420	1,280	2,270	185	4,620	38,800	63
November	19	88	324	517	918	1,610	197	3,670	42,500	59
December	21	75	433	393	960	1,850	551	4,280	46,800	21
January-December	586	1,060	3,330	4,210	10,900	22,800	3,940	46,800	XX	439
1997:										
January	20	72	442	513	862	1,740	455	4,100	4,100	56
February	39	114	416	134	1,000	1,690	515	3,920	8,020	89
March	26	93	616	172	1,210	1,280	488	3,880	11,900	61
April	33	84	725	148	1,480	2,740	684	5,890	17,800	158
May	29 r/	102	913	124	1,290	1,610	439	4,510	22,300	58
June	52	97	900	172	963	3,540	258	5,990	28,300	56
July	19	55	661	165	676	2,970	428	4,970 r/	33,300	109
August:										
Australia	--	--	--	--	--	--	--	--	79	--
Belgium	--	6	--	--	--	37	78	121	398	--
Canada	19	36	--	27	421	318	47	868	8,470	2
Germany	(5/)	5	--	(5/)	60	3	1	70	544	3
India	--	1	204	--	--	6	(5/)	211	1,640	--
Italy	--	(5/)	--	--	--	--	--	(5/)	95	--
Japan	--	1	103	(5/)	102	70	137	413	3,240	--
Korea, Republic of	--	3	--	--	--	524	2	529	5,700	13
Mexico	2	5	10	(5/)	--	1,240	23	1,280	4,050	10
Netherlands	--	(5/)	--	--	--	4	4	9	343	--
Spain	--	--	--	--	--	1	--	1	2,740	--
Sweden	--	--	--	--	133	31	--	164	1,720	(5/)
Taiwan	--	(5/)	171	--	--	857	15	1,040	5,300	--
United Kingdom	--	1	--	--	--	2	1	4	355	6
Other	7	5	3	76	10	115	368	584	3,900	16
Total	28	63	491	103	726	3,210	676	5,300	38,600	50
1997: January-August	246	681	5,160	1,530	8,210	18,800	3,940	38,600	XX	638
1996: January-August	520	738	2,030	2,520	6,510	14,800	2,720	29,800	XX	270

r/ Revised. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%), sulfates (22%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide and hydroxide (65%).

3/ Excludes wrought nickel.

4/ May include revisions for prior months.

5/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight)

Period and country of origin	Unwrought alloyed ingot	Bars, rods, and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total	Total year to date 2/
1996:									
August	91	219	97	187	(3/)	49	615	1,260	7,220
September	117	70	144	133	(3/)	50	59	573	7,800
October	249	151	120	90	(3/)	72	60	741	8,540
November	349	161	168	81	(3/)	66	29	854	9,390
December	151	178	256	145	(3/)	48	64	843	10,200
January-December	2,780	2,110	1,810	1,520	2	832	1,190	10,200	XX
1997:									
January	208	132	196	98	--	100	108	841	841
February	181	202	190	149	--	96	107	926	1,770
March	265	184	266	90	(3/)	117	52	974	2,740
April	234	186	283	139	--	298	61	1,200	3,940
May	457	148	290	190	1	104	56	1,250	5,190
June	431	190	346	150	3	134	68	1,320	6,510
July	463	224	283	247	(3/)	186	66	1,470	7,980
August:									
Australia	178	--	--	--	--	--	--	178	1,480
Belgium	--	--	--	--	--	--	--	--	112
Canada	52	--	1	--	--	195	2	250	455
France	--	(3/)	61	9	(3/)	(3/)	2	72	732
Germany	2	43	62	112	--	38	1	258	2,160
Italy	--	82	3	--	--	15	(3/)	100	641
Japan	10	(3/)	5	(3/)	--	104	1	120	661
Mexico	(3/)	--	--	--	--	--	--	(3/)	4
Netherlands	--	--	--	--	--	--	11	11	74
South Africa	--	42	--	--	--	--	--	42	281
Sweden	--	--	97	4	--	--	--	102	1,190
United Kingdom	33	48	(3/)	(3/)	(3/)	11	1	94	819
Other	61	1	22	18	--	--	18	120	717
Total	336	216	251	143	(3/)	363	36	1,350	9,320
1997: January-August	2,580	1,480	2,110	1,210	4	1,400	554	9,320	XX
1996: January-August	1,910	1,550	1,120	1,070	1	596	975	7,220	XX

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ May include revisions for prior months.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 7
U.S. EXPORTS OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight)

Period and country of destination	Unwrought alloyed ingot	Bars, rods, and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total 2/	Total year to date 2/
1996:									
August	540	184	176	619	5	96	183	1,800	15,900
September	274	177	166	622	9	78	176	1,500	17,400
October	602	240	147	600	12	49	394	2,040	19,400
November	485	340	113	725	5	74	276	2,020	21,400
December	478	191	119	971	9	146	129	2,050	23,500
January-December	5,710	3,210	1,560	8,000	200	1,270	3,520	23,500	XX
1997:									
January	541	320	115	838	10	91	120	2,030	2,030
February	641	222	137	554	20	136	180	1,890	3,930
March	425	334	152	845	23	99	597	2,480	6,400
April	344	225	224	649	14	90	374	1,920	8,320
May	262	290	212	810	15	81	146	1,820	10,100
June	357	319	195	781	11	131	686	2,480	12,600
July	293	193	229	525	19	114	439	1,810	14,400
August:									
Australia	--	1	3	137	--	1	(3/)	142	696
Belgium	--	--	--	(3/)	(3/)	18	--	18	146
Canada	30	41	50	50	4	54	41	270	2,390
France	147	32	1	8	(3/)	--	15	202	1,610
Germany	19	32	4	27	--	--	--	82	583
India	--	--	(3/)	--	(3/)	--	(3/)	1	12
Ireland	--	(3/)	78	(3/)	--	--	(3/)	79	335
Italy	11	(3/)	(3/)	165	(3/)	(3/)	--	177	950
Japan	35	8	14	69	--	(3/)	14	140	1,580
Korea, Republic of	--	1	2	34	--	1	8	45	721
Mexico	(3/)	5	45	11	--	13	1	78	508
Netherlands	9	17	(3/)	13	--	--	(3/)	40	350
Singapore	--	6	10	1	--	--	1	17	152
Spain	--	--	(3/)	--	--	(3/)	--	1	70
Sweden	--	(3/)	3	6	4	--	--	13	137
Switzerland	(3/)	--	--	7	--	(3/)	1	8	114
Taiwan	1	3	1	1	--	5	23	33	327
United Kingdom	53	82	47	123	1	5	7	318	3,130
Other	15	18	11	47	--	34	127	252	2,530
Total	320	246	269	699	9	131	238	1,910	16,300
1997: January-August	3,180	2,150	1,530	5,700	120	873	2,780	16,300	XX
1996: January-August	3,870	2,260	1,020	5,080	165	921	2,540	15,900	XX

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ May include revisions for prior months.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 8
NICKEL CONSUMPTION IN CAST AND WROUGHT PRODUCTS

	Percent	
	Wrought	Cast
September 1997:		
Stainless and heat resisting steels	97	3
Alloy steels	91	9
Superalloys	70	30
Copper-nickel alloys	100	(1/)
Other nickel-base alloys	100	(1/)

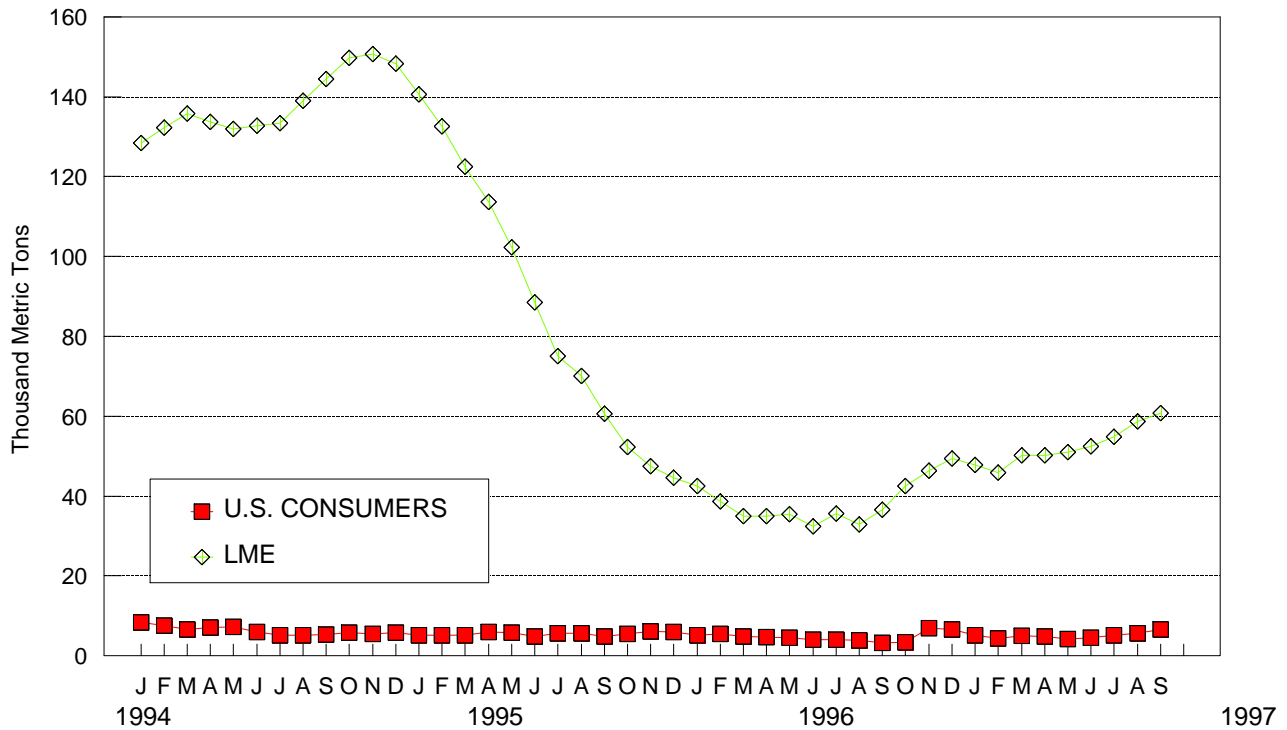
1/ Less than 1/2 unit.

TABLE 9
NICKEL PRICES

Date	Cathode NY Dealer \$/lb.	LME Cash \$/t	LME Cash \$/lb.	18/8 Stainless steel scrap Pittsburgh \$/long ton(gw)
1997:				
Average for the month of:				
August	3.144	6,761.300	3.067	795
September	3.042	6,503.841	2.950	790
October	2.973	6,380.326	2.894	770
For week ending:				
August 1	3.17-3.49	7,285.800	3.305	800-820
August 8	3.31-3.43	7,115.500	3.228	790-800
August 15	3.11-3.32	6,654.900	3.019	790-800
August 22	3.09-3.13	6,591.300	2.990	790-800
August 29	3.06-3.10	6,518.125	2.957	790-800
September 5	3.10-3.12	6,563.300	2.977	785-795
September 12	3.12-3.14	6,527.000	2.961	785-795
September 19	2.99-3.04	6,376.600	2.892	785-795
September 26	2.99-3.03	6,406.500	2.906	785-795
October 3	3.11-3.23	6,740.500	3.057	765-775
October 10	3.06-3.11	6,550.000	2.971	765-775
October 17	2.98-3.04	6,422.500	2.913	765-775
October 24	2.90-3.05	6,289.000	2.853	765-775
October 31	2.87-2.96	6,091.000	2.763	765-775
November 7	2.86-2.90	6,092.500	2.764	765-775

Sources: Platt's Metals Week and American Metal Market.

1994-97 STOCKS



1994-97 AVERAGE MONTHLY PRICES (Derived from Metals Week and American Metal Market quotations)

